

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF VIRGINIA
Norfolk Division

CENTRIPETAL NETWORKS, LLC,
Plaintiff,

v.

Civil Action No. 2:21-CV-00137 (EWH)

PALO ALTO NETWORKS, INC.,
Defendant.

MEMORANDUM OPINION AND ORDER

This matter is before the Court on Palo Alto Networks, Inc.’s (“PAN”) Motion for Summary Judgment. ECF No. 460. PAN asserts the undisputed evidence establishes (1) no direct infringement of any Asserted Patent;¹ (2) no indirect infringement of any Asserted Patent; (3) invalidity of the ’437 Patent under 35 U.S.C. § 112; (4) no willful infringement; and (5) no infringement based on foreign sales. *Id.* Centripetal Networks, LLC (“Centripetal”) filed its response in opposition to PAN’s Motion for Summary Judgment, and PAN replied. Resp. in Opp’n, ECF No. 515; Reply, ECF No. 565. Accordingly, the matter is ripe for adjudication.

For the reasons stated below, PAN’s Motion for Summary Judgment is DENIED in part. The Court RESERVES ruling on the issue of infringement of the ’380 Patent until after the hearing scheduled for January 4, 2024.²

¹ The Asserted Patents include U.S. Patent Nos. 10,567,437 (the “’437 Patent”), 10,735,380 (the “’380 Patent”), 10,530,903 (the “’903 Patent”), 10,659,573 (the “’573 Patent”), and 10,931,797 (the “’797 Patent”).

² The Court has determined that the issues other than infringement of the ’380 Patent are adequately presented in the briefing and a hearing is not necessary. E.D. Va. Loc. Civ. R. 7(J).

I. LEGAL STANDARD

A. Summary Judgment

Under Federal Rule of Civil Procedure 56, a party may move for summary judgment on a claim or defense, or part of a claim or defense. Fed. R. Civ. P. 56(a). The district court will “grant summary judgment if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” *Id.* A fact is material if “its existence or non-existence would affect disposition of the case under applicable law.” *Wai Man Tom v. Hosp. Ventures LLC*, 980 F.3d 1027, 1037 (4th Cir. 2020) (citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986)). “A genuine question of material fact exists where, after reviewing the record as a whole, a court finds that a reasonable jury could return a verdict for the nonmoving party.” *Dulaney v. Packaging Corp. of Am.*, 673 F.3d 323, 330 (4th Cir. 2012) (citations omitted).

The movant bears the initial burden of demonstrating that there is no genuine issue of material fact. *Wai Man Tom*, 980 F.3d at 1037 (citing *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986)). The nonmoving party must then establish that specific, material facts exist that would give rise to a genuine issue. *Id.* In reaching its decision, “the court must draw all reasonable inferences in favor of the nonmoving party, and it may not make credibility determinations or weigh the evidence.” *Reeves v. Sanderson Plumbing Prods., Inc.*, 530 U.S. 133, 150 (2000) (citations omitted).

B. Infringement

Infringement analysis is a two-step process: “[f]irst, the court determines the scope and meaning of the patent claims asserted, and then the properly construed claims are compared to the allegedly infringing device.” *Cordis Corp. v. Bos. Sci. Corp.*, 658 F.3d 1347, 1354 (Fed. Cir. 2011) (quoting *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998)). In order to show

infringement, “the plaintiff must establish by a preponderance of the evidence that the accused device infringes one or more claims of the patent either literally or under the doctrine of equivalents.” *Bayer AG v. Elan Pharm. Rsch. Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). “To prove literal infringement, the patentee must show that the accused device contains *each and every limitation* of the asserted claims.” *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1215 (Fed. Cir. 2014) (emphasis in original). “[I]f even one limitation is not met, there is no literal infringement.” *E.I. du Pont De Nemours & Co. v. Unifrax I LLC*, 921 F.3d 1060, 1073 (Fed. Cir. 2019). “Where a defendant seeks summary judgment of non-infringement, ‘nothing more is required than the filing of a . . . motion stating that the patentee had no evidence of infringement and pointing to the specific ways in which accused [products] did not meet the claim limitations.’” *Novatek, Inc. v. Sollami Co.*, 559 F. App’x 1011, 1022 (Fed. Cir. 2014) (alterations in original) (quoting *Exigent Tech., Inc. v. Atrana Sols., Inc.*, 442 F.3d 1301, 1309 (Fed. Cir. 2006)). The burden then shifts to the patentee to “identify genuine issues that preclude summary judgment.” *Id.* (quoting *Optivus Tech., Inc. v. Ion Beam Applications S.A.*, 469 F.3d 978, 990 (Fed. Cir. 2006)).

II. DISCUSSION

A. Direct Infringement of the Asserted Patents

PAN asserts that it is entitled to summary judgment of non-infringement as to each Asserted Patent. The Court will first address the ’437 Patent, then the ’903 Patent, ’573 Patent, and ’797 Patent, which are of the same patent family and collectively referred to as the Correlation Patents. As noted above, the Court reserves ruling on PAN’s motion for summary judgment of non-infringement on the ’380 Patent.

1. The '437 Patent

Centripetal accuses two products of infringing claim 8 of the '437 Patent: Panorama alone and Panorama in combination with Next Generation Firewall(s) ("NGFW(s)") (collectively, the "'437 Accused Products"). Pl.'s Suppl. Objs. & Resp. to Def.'s 1st Set of Interrogs., Appendix A ("Infringement Contentions"), ECF No. 462-33. PAN asserts that it is entitled to summary judgment that the '437 Accused Products do not infringe claim 8 of the '437 Patent. Mem. in Supp. at 13, ECF No. 462. Specifically, PAN argues Centripetal cannot establish two claim limitations: (1) the NGFW does not apply packet filtering rules to "all network traffic," *id.* at 13–16, and (2) NGFWs are not deployed such that they form "a plurality of packet security gateways that collectively provide an entire interface across a boundary of a network," *id.* at 16–18.³ The Court finds that there is a genuine dispute of material fact regarding the satisfaction of each limitation.

a. Applying "Packet Filtering Rules" to "All Network Traffic"

The '437 Patent requires that a packet security gateway is provisioned "with one or more packet filtering rules to be applied to all network traffic traversing the boundary, wherein each packet filtering rule comprises at least one packet matching criterion associated with malicious network traffic and a corresponding packet transformation function." '437 Patent at 22:29–39. PAN argues that this element requires "that the claimed system provision a packet filtering rule that applies to 'all network traffic' traversing the boundary of the protected network." Mem. in Supp. at 14, ECF No. 462 (emphasis in original); *see also* Reply at 1, ECF No. 565. That is, PAN

³ The focus of the parties' dispute at summary judgment relates to the functions of PAN's NGFWs. While PAN briefly asserts that Panorama alone is not capable of infringement, Mem. in Supp. at 18, ECF No. 462 (emphasis omitted), Centripetal disagrees, arguing that Panorama contains the infringing functionality. Resp. in Opp'n at 14, ECF No. 515. The Court finds that this dispute is not sufficiently developed to allow for consideration.

asserts that the element requires the same one rule be applied to all network traffic. However, this construction would impermissibly limit the claim language, which provides that a packet security gateway can be provisioned “with one *or more* packet filtering rules to be applied to all network traffic traversing the boundary.” ’437 Patent at 22:34–36 (emphasis added). Accordingly, in a situation where a packet security gateway is provisioned with more than one packet filtering rule, the claim is satisfied so long as all network traffic is subject to at least one of the packet filtering rules.

As to the characteristics of the “one or more packet filtering rules,” PAN argues that the rule applied to all network traffic “must include ‘at least one packet matching criterion associated with malicious network traffic’ and must cause the [packet security gateway] to ‘drop the portion of the received packets’ that correspond to the packet matching criterion.” Reply at 2, ECF No. 565. PAN’s argument, while not entirely clear, appears to conflate two claim elements in a way that is not supported by the claim language or the specification. The ’437 Patent requires that “each packet filtering rule *comprises at least one packet matching criterion associated with malicious network traffic and a corresponding packet transformation function.*” ’437 Patent at 22:34–39 (emphasis added). The specification of the ’437 Patent clearly indicates that the packet transformation function can include dropping packets, forwarding packets, or some other function specified by the rules. *See id.* at 1:66–2:3 (“Performing the at least one of multiple packet transformation functions . . . may include performing at least one packet transformation function other than forwarding or dropping the packets.”). The claim then ultimately requires that “responsive to a determination . . . that a portion of the received packets corresponds to at least one packet matching criterion specified by the *one or more packet filtering rules*, drop a *portion* of the received packets.” *Id.* at 22:61–65 (emphasis added). As this element indicates, at least some

portion of the packets must be subject to a packet filtering rule which causes them to be dropped. However, in situations where more than one packet filtering rule is provisioned, not all packet filtering rules are required to contain a drop function. Accordingly, to meet the limitations of the '437 Patent, Centripetal must demonstrate that all network traffic traversing the boundary is subject to a packet filtering rule that contains both (1) a "packet matching criterion associated with malicious network traffic" and (2) "a corresponding packet transformation function," that may or may not be a drop function if the packet security gateway is provisioned with more than one rule. *Id.*

Having clarified what the claim requires, the Court must then consider whether this functionality is present in the '437 Accused Products. Factually, the parties dispute whether all packets are subject to packet filtering rules as traffic flows through the NGFW. PAN argues that certain types of packets are removed from further inspection, i.e., they "bypass firewall rules in the security policy" and "are not subject to rules that could cause them to be dropped." Mem. in Supp. at 14–15, ECF No. 462. PAN submits expert testimony and technical documents that it asserts demonstrate that some packets are forwarded through the NGFW without being subject to a packet filtering rule. *See* Rebuttal Expert Report of John Villasenor ¶¶ 395–411, ECF No. 462-1; ECF No. 461-24 at 504.⁴ Centripetal's expert, Dr. Michael Mitzenmacher, disagrees, opining that "firewall rules are still applied to determine whether to bypass the fast and/or slow paths." Reply Expert Report of Dr. Michael Mitzenmacher ("Mitzenmacher Reply Rpt.") ¶ 103, ECF No. 518-2. Having reviewed the expert reports and technical documents, the Court concludes that a genuine

⁴ For exhibits submitted with Bates numbering, the Court's pin cites consist of the last three digits of the Bates number.

dispute of material fact exists regarding whether the NGFW's initial determination to forward a packet without inspection is a packet filtering rule as defined by the claim language.

PAN also argues that even if the above action constitutes a rule, that rule does not contain criteria associated with malicious network traffic. Reply at 2, ECF No. 565. However, Dr. Mitzenmacher disagrees, stating that the NGFW's packet filtering rules "may have multiple parts or criteria," including "criteria determined from network threat intelligence information, which is associated with malicious network traffic." Mitzenmacher Reply Rpt. ¶¶ 103, 105, ECF No. 518-2. Upon reviewing the expert reports and the technical documents, the Court again finds that this presents a genuine dispute of material fact that must be decided by the jury.

b. "A Plurality of Packet Security Gateways that Collectively Provide an Entire Interface"

The '437 Patent requires "a plurality of packet security gateways that collectively provide an entire interface across a boundary of a network protected by the packet security gateway and one or more networks other than the network protected by the packet security gateway." '437 Patent at 22:29–34. The Court construed this claim limitation as "two or more packet security gateways arranged such that there is no network path across a boundary of a network that bypasses the packet security gateways." Mem. Op. & Order at 29, ECF No. 452.

The parties dispute whether two or more NGFWs are deployed to protect a network and are arranged so that there is no network path across a boundary of the protected network. PAN argues that Centripetal has provided no evidence of multiple NGFWs deployed to protect a network or that the NGFWs are deployed in such a way that they fully protect a boundary of the network. Mem. in Supp. at 16–18, ECF No. 462. Centripetal points to several technical documents as evidence that NGFWs are deployed in a configuration that requires two or more firewalls. *See* ECF No. 518-14 at 630 (illustrating two firewalls deployed together); ECF No. 518-15 at 974

(contemplating deployment of 100 firewalls or more). Further, Dr. Mitzenmacher describes PAN's Zero Trust model and explains that a NGFW configured to allow traffic to bypass the NGFW "amounts to a misconfiguration" and "defeats the purpose of NGFWs as a gateway." Expert Report of Dr. Michael Mitzenmacher ("Mitzenmacher Opening Rpt."), App. '437 ¶¶ 27–30, ECF No. 518-4. The Court finds that this presents a genuine dispute of material fact that must be decided by the jury.

Having found that there is a genuine dispute of material fact as to whether the '437 Accused Products satisfy the contested claim limitations, PAN's motion for summary judgment of non-infringement of the '437 Patent is DENIED.

2. The Correlation Patents

Centripetal accuses the following products of infringing the asserted claims⁵ of the Correlation Patents: NGFW, NGFW in combination with Cortex XDR, NGFW in combination with Cortex XDR and Cortex XSOAR, and NGFW in combination with Cortex XSIAM (collectively, the "Correlation Accused Products").⁶ Infringement Contentions, ECF No. 462-33. PAN asserts that is entitled to summary judgment that the Correlation Accused Products do not infringe the Correlation Patents. Mem. in Supp. at 23–30, ECF No. 462. Specifically, PAN argues that two claim limitations are not met: (1) the Correlation Accused Products do not log packets transmitted by the network device or correlate those logs with received packets, *id.* at 24–29; and (2) the Correlation Accused Products do not generate a rule or indication "responsive to" or "based

⁵ The asserted claims of the Correlation Patents include: claim 10 of the '903 Patent; claims 1 and 9 of the '573 Patent; and claims 1, 12, and 17 of the '797 Patent. The claims disclose similar steps for correlating packets and the differences among the claims are irrelevant to the issues before the Court at summary judgment.

⁶ In addition, Centripetal accuses Cortex XDR in combination with Cortex XSOAR as infringing the '797 Patent. Infringement Contentions, ECF No. 462-33.

on” the correlating, *id.* at 29–30. Further, PAN argues that Centripetal cannot show that the “correlation” limitation is met under the doctrine of equivalents. *Id.* at 27–29. The Court finds that there is a genuine dispute of material fact regarding both limitations and infringement under the doctrine of equivalents.

a. Generate/Determine “Log Entries” Corresponding to Packets Transmitted by the Network Device and Correlate with Packets Received by the Network Device

The Correlation Patents require generating or determining “log entries” corresponding to packets transmitted by the network device. *See* ’903 Patent at 17:4–9; ’573 Patent at 17:14–16; ’797 Patent at 15:33–36. PAN argues that the Correlation Accused Products “do not generate/determine ‘log entries’ corresponding to packets transmitted by the claimed ‘network device’ and thus cannot correlate packets using such log entries.” Mem. in Supp. at 24, ECF No. 462. Centripetal’s expert, Dr. Eric Cole, offers several examples where, in his opinion, a NGFW generates log entries related to transmitted packets. *See, e.g.*, Reply Expert Report of Dr. Eric Cole (“Cole Reply Rpt.”) ¶¶ 44, 47, 63, ECF No. 518-6 (identifying post-NAT information captured by NGFWs as log entries of transmitted packets); Videotaped Dep. of Dr. Eric Cole at 130:18–133:20, ECF No. 518-8 (same); *id.* at 109:2–22 (identifying the “packets sent” field as referring to packets that a NGFW transmits); ECF No. 516-22 at 611–15 (listing the traffic log fields as including “Post-NAT” and “Packets Sent” information). PAN disagrees with this opinion and argues that the examples identified by Dr. Cole are either not “log entries” or are not related to packets transmitted by the NGFW. Reply at 10–13, ECF No. 565. The Court finds that while PAN may disagree with Dr. Cole’s conclusions, Dr. Cole’s opinion has a sufficient factual foundation to create a genuine dispute of material fact as to whether the NGFW determines or generates log entries related to the transmitted packets and relatedly whether the log entries are subsequently correlated with log entries corresponding to received packets. *Cf. Intell. Sci. & Tech., Inc. v. Sony Elecs., Inc.*, 589

F.3d 1179, 1183–84 (Fed. Cir. 2009) (explaining that to support a summary judgment motion, an expert’s opinion must contain a sufficient factual foundation and a logical line of reasoning arising from that foundation). Such a factual dispute precludes summary judgment on whether this limitation is met.

b. Generate a Rule or Indication “Responsive to” or “Based on” the Correlating

The Correlation Patents also require that a rule or indication is generated “responsive to” or “based on” the correlating of log entries. *See, e.g.*, ’903 Patent at 17:19–21; ’573 Patent at 17:29–31; ’797 Patent at 18:14–16. The Court previously construed “responsive to” and “based on” to mean that “the correlating or the determined correlation is the impetus for the remedial steps.” Mem. Op. & Order at 15, ECF No. 452. PAN argues that Centripetal cannot establish that the correlating action is the impetus for the rule or indication in the Correlation Accused Products. Mem. in Supp. at 29–30, ECF No. 462.

Dr. Cole offers his opinion that the Automated Correlation Engine (“ACE”), which is included in certain NGFWs, “correlate[s] log entries and then uses a finite state machine in order to apply rules to the traffic.” Expert Report of Dr. Eric Cole (“Cole Opening Rpt.”) ¶ 101, ECF No. 518-5. PAN asserts that the ACE first correlates log entries and then matches the correlated log entries to a *correlation object*, which then generates the indication or rule. Mem. in Supp. at 29, ECF No. 462. As a result, PAN argues, the match between the *correlation object* and the correlation of log entries is the impetus for generating the rule or indication, not the correlation of log entries. *Id.* at 29–30. Dr. Cole asserts that PAN’s interpretation “misstates the operation of the Automated Correlation Engine.” Cole Reply Rpt. ¶ 82, ECF No. 518-6. Dr. Cole explains, “[t]he ACE finite state machine will receive various logs that are generated as a result of the session table correlating information. The ACE will receive the logs and *compare them to each other* before

comparing them to the correlating object.” *Id.* (emphasis in original). Centripetal argues that even if the correlated log entries are compared to a correlation object, the responsive to/based on limitation is still satisfied because “if the logs . . . are not correlated, no rules would be created.” Resp. in Opp’n at 26–27, ECF No. 515. The disagreement as to how the Automated Correlation Engine functions is sufficient to create a genuine dispute of material fact that precludes summary judgment. And, even if the parties agreed about how the Automated Correlation Engine functions, whether a particular action is “the impetus” is a question of fact to be left to the jury.

c. Doctrine of Equivalents of the “Correlation” Limitation

PAN argues that the Correlation Accused Products do not perform the “correlation” limitation under the doctrine of equivalents because Dr. Cole’s analysis consists of “generic, conclusory assertions” and he has not demonstrated that the products perform in substantially the same way as the patented methods. Mem. in Supp. at 27–28, ECF No. 462. The Court disagrees with PAN’s representation of Dr. Cole’s analysis and finds that there are material facts in dispute.

To support a finding of infringement under the doctrine of equivalents, the patentee must demonstrate that the difference between the accused product and claimed invention is “insubstantial.” *AquaTex Indus., Inc. v. Techniche Sols.*, 479 F.3d 1320, 1326 (Fed. Cir. 2007). One way of proving infringement under the doctrine of equivalents is the function-way-results test: “the accused product or method performs the substantially same function in substantially the same way with substantially the same result as each claim limitation of the patented product or method.” *Id.* The patentee must provide particularized testimony on a limitation-by-limitation basis as to the insubstantiality of the differences between the patent claims and the accused products. *Id.* at 1328 (citing *Tex. Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1567 (Fed. Cir. 1996)). However, the particularized testimony standard does not require an expert

“to re-start his testimony at square one when transitioning to a doctrine of equivalents analysis.”
Paice LLC v. Toyota Motor Corp., 504 F.3d 1293, 1305 (Fed. Cir. 2007).

While generalized conclusions cannot support a finding of infringement under the doctrine of equivalents, that is not the case here. Dr. Cole pointed to specific functions of the Correlation Accused Products that he identified as performing substantially the same function as the correlation limitation. *See, e.g.*, Cole Opening Rpt. ¶ 184, ECF No. 518-5 (explaining that the Correlation Accused Products “use[] the packet information, including the first data, second data, the timestamp differences, and/or at least a correlation object (used by Automated Correlation Engine), log stitching (used by Cortex XDR), or causality/analytics engine (used by Cortex XDR)” to “perform the same function by matching data sets to determine whether they share common attributes”). Further, he explained how the Correlation Accused Products perform those functions in substantially the same way to achieve substantially the same result. *See id.* ¶ 185 (explaining how the ACE and Cortex XDR perform in substantially the same way as the “correlation” limitation); *id.* ¶ 186 (identifying that “[t]he [Correlation] Accused Product[s] achieve[] substantially the same result of correlation, which identifies matches of shared common attributes”). Whether the Correlation Accused Products in fact function in a way that infringes the asserted claims under the doctrine of equivalents is a question for the jury. However, the Court finds that Dr. Cole’s opinion is sufficiently particularized to create a genuine dispute of material fact.

Having found that there is a genuine dispute of material fact as to whether the Correlation Accused Products satisfy all the contested claim limitations, PAN’s motion for summary judgment of non-infringement of the Correlation Patents is DENIED.

B. Indirect Infringement

PAN asserts that it is entitled to summary judgment on the issue of indirect infringement. Mem. in Supp. at 30–31, ECF No. 462. Specifically, PAN argues that Centripetal can submit no proof of an underlying act of direct infringement by PAN’s customers outside the conclusory statements of Centripetal’s experts. *Id.* The Court disagrees and finds that the evidence relied on by Centripetal’s experts is sufficient to create a dispute of material fact regarding whether PAN’s customers directly infringe the Asserted Patents.

A defendant may be found liable for indirectly infringing a patent by (1) inducing direct infringement or (2) contributing to direct infringement. 35 U.S.C. § 271(b), (c). To succeed on either theory of indirect infringement, the patentee must make a prerequisite showing of “specific instances of direct infringement” by someone other than the defendant or demonstrate that “the accused device necessarily infringes the patent in suit.” *Toshiba Corp. v. Imation Corp.*, 681 F.3d 1358, 1364 (Fed. Cir. 2012) (quoting *ACCO Brands, Inc. v. ABA Locks Mfr. Co.*, 501 F.3d 1307, 1313 (Fed. Cir. 2007)). Hypothetical acts do not suffice to show direct infringement. *See Dynacore Holdings Corp. v. U.S. Philips Corp.*, 363 F.3d 1263, 1274 (Fed. Cir. 2004). However, a patentee may rely on circumstantial evidence sufficient to permit the jury to imply direct infringement. *Metabolite Lab’ys, Inc. v. Lab’y Corp. of Am. Holdings*, 370 F.3d 1354, 1364–65 (Fed. Cir. 2004); *see also Toshiba Corp.*, 681 F.3d at 1364.

Centripetal’s direct evidence of infringement by a PAN customer is limited. Dr. Cole points to an incident analysis presentation that PAN prepared for an existing customer. *See* ECF No. 519-17. Dr. Cole opines that this presentation reflects that at least one existing customer installed and used PAN’s hardware and software in a combination that infringes. Cole Opening Rpt. ¶ 547, ECF No. 518-5. And, as Centripetal’s counsel points out, the document does reference the customer’s

use of Cortex XDR and a NGFW. Resp. in Opp’n at 29, ECF No. 515 (citing ECF No. 519-17). In addition to this direct evidence of infringement, Centripetal’s experts, Dr. Cole and Dr. Mitzenmacher, also rely on circumstantial evidence in support of their conclusion that PAN’s customers directly infringe. For example, both experts point to instructional documents that PAN provides its customers that describe the installation and operation of the Accused Products in a manner that would infringe. Mitzenmacher Opening Rpt. ¶ 112, ECF No. 518-1; Cole Opening Rpt. ¶ 548, ECF No. 518-5. Further, both experts opine that the default functionality of the products results in direct infringement by the user. Cole Reply Rpt. ¶ 173, ECF No. 518-6; *see* Mitzenmacher Reply Rpt. ¶¶ 47–53, ECF No. 518-2. The Court finds that this evidence is sufficient to create a genuine dispute of material fact regarding whether PAN’s customers directly infringe the Asserted Patents.

PAN’s motion for summary judgment on Centripetal’s claims of indirect infringement is DENIED.

C. Validity of the ’437 Patent

PAN asserts it is entitled to summary judgment that claim 8 of the ’437 Patent is invalid under 35 U.S.C. § 112 for lack of a written description. Mem. in Supp. at 31–35, ECF No. 462. The Court disagrees. After reviewing the expert opinions of Dr. Michael Goodrich and Dr. Seth Nielson, as well as the patent specification, the Court finds there is a genuine issue of material fact regarding whether the ’437 Patent satisfies the written description requirement.

A patent’s specification must “contain a written description of the invention . . . in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same.” 35 U.S.C. § 112(a). The test regarding the sufficiency of a written description “is whether the disclosure of the application relied upon reasonably conveys

to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 682 (Fed. Cir. 2015) (quoting *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)). The specification does not need to describe the claimed subject matter in exactly the same terms as used in the claims, but instead “the written description requirement can be satisfied by words, structures, figures, diagrams, formulas, etc.” *Koito Mfg. Co. v. Turn-Key-Tech, LLC*, 381 F.3d 1142, 1154 (Fed. Cir. 2004) (emphasis omitted) (internal quotation marks and citations omitted). It is the burden of the party challenging validity to prove invalidity by clear and convincing evidence. *Vasudevan Software, Inc.*, 782 F.3d at 682 (citation omitted). “Compliance with the written description requirement is a question of fact but is amenable to summary judgment in cases where no reasonable fact finder could return a verdict for the non-moving party.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1307 (Fed. Cir. 2008) (citing *Invitrogen Corp. v. Clontech Lab’ys, Inc.*, 429 F.3d 1052, 1072–73 (Fed. Cir. 2005)).

At issue is the final element in the ’437 Patent, which the parties refer to as the “LAN switch element.” The ’437 Patent requires a system comprising “at least one processor” and “memory storing instructions” to configure a packet security gateway to “modify a switching matrix of a local area network (LAN) switch associated with the packet security gateway such that the LAN switch is configured to drop the portion of the received packets responsive to the determination by the packet security gateway.”⁷ ’437 Patent at 22:26–28, 66–23:4. PAN argues that the specification fails to disclose the LAN switch element and that the expert opinion provided

⁷ The parties agreed that “switching matrix of a local area network (LAN) switch” means “a switching matrix contained within a LAN switch that is configured to direct traffic in a LAN.” Am. Joint Claim Construction Chart at 1, ECF No. 419-1.

by Centripetal's expert, Dr. Goodrich, fails to create a dispute of material fact. Mem. in Supp. 31–35, ECF No. 462.

Dr. Goodrich offers the opinion that “the entire specification provides context and support for how this term is used” and points to two examples demonstrating how a person of ordinary skill in the art would recognize that the inventor had possession of the LAN switch element. Rebuttal Expert Report of Dr. Michael T. Goodrich ¶ 1407, ECF No. 516-7. Specifically, Dr. Goodrich points to a portion of the specification which discloses “using a multi-dimensional switching service within a network environment, including transformation functions” and a portion of the specification discussing the “switching matrix in a LAN switch.” *Id.*; '437 Patent at 10:23–33, 19:5–47. While Dr. Goodrich's opinion could be more thorough, the Court finds that Dr. Goodrich's report is more than merely conclusory, as it points to specific portions of the '437 Patent as evidence of a written description of the LAN switch element. *See Vasudevan Software, Inc.*, 782 F.3d at 683. Further, the Court's review of the relevant portions of the specification leads it to conclude that Dr. Goodrich's testimony raises a genuine issue of material fact regarding whether the '437 Patent discloses the LAN switch element.

PAN's motion for summary judgment of invalidity of the '437 Patent is DENIED.

D. Willfulness

PAN asserts that if Centripetal succeeds in proving infringement, Centripetal nevertheless cannot demonstrate that PAN's pre-suit or post-suit conduct constitutes willful infringement. Mem. in Supp. at 35–37, ECF No. 462. The Court finds that there is a genuine dispute of material fact regarding willfulness.

“To establish willfulness, the patentee must show the accused infringer had a specific intent to infringe at the time of the challenged conduct.” *Bayer Healthcare LLC v. Baxalta Inc.*, 989 F.3d

964, 987 (Fed. Cir. 2021) (citing *Halo Elecs., Inc. v. Pulse Elecs., Inc.*, 579 U.S. 93, 105–06 (2016)). Willfulness is determined based on the totality of the circumstances, but “a party cannot be found to have ‘willfully’ infringed a patent of which the party had no knowledge.” *Gustafson, Inc. v. Intersystems Indus. Prods., Inc.*, 897 F.2d 508, 510–11 (Fed. Cir. 1990); see *State Indus., Inc. v. A.O. Smith Corp.*, 751 F.2d 1226, 1236 (Fed. Cir. 1985) (“To willfully infringe a patent, the patent must exist and one must have knowledge of it.” (emphasis omitted)); *Bayer Healthcare LLC*, 989 F.3d at 988 (“Knowledge of the asserted patent and evidence of infringement is necessary, but not sufficient, for a finding of willfulness.”).⁸ It is the patentee’s burden to prove willful infringement by a preponderance of the evidence. *Bayer Healthcare LLC*, 989 F.3d at 987. Generally, the issue of willful infringement is a “classic[] jury question of intent.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1341 (Fed. Cir. 2016) (quotation marks and citation omitted). That being said, summary judgment is appropriate when an absence of evidence demonstrates that no reasonable jury could make a finding of willfulness.

The primary dispute between the parties regarding willfulness centers on whether a reasonable jury could conclude that PAN had pre-suit knowledge of the Asserted Patents.

⁸ Centripetal asserts that in addition to knowledge of the Asserted Patents, PAN “was willfully blind to the existence of the Asserted Patents.” Resp. in Opp’n at 32, 35–36, ECF No. 515. The Federal Circuit has recognized that willfulness can be found where the defendant recklessly disregarded a patentee’s rights or acted despite a known or obvious risk of infringement. *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1371 (Fed. Cir. 2017) (upholding a jury instruction that willfulness could be proven if the infringer “should have known that its actions constituted an unjustifiably high risk of infringement of a valid and enforceable patent”). Even so, Centripetal has failed to identify evidence supporting an inference of willful blindness here. Specifically, Centripetal does not point to any evidence that would allow a reasonable fact finder to infer that PAN took “deliberate actions to avoid confirming a high probability of wrongdoing.” See *Corephotonics, Ltd. v. Apple, Inc.*, No. 17-CV-06457, 2018 WL 4772340, at *9 (N.D. Cal. Oct. 1, 2018) (quoting *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 769 (2011)). Given this lack of evidence, no reasonable jury could conclude that PAN was willfully blind to the existence of the Asserted Patents.

Centripetal does not assert that it notified PAN of the Asserted Patents or any potential infringement. Nevertheless, Centripetal points to several categories of evidence which it argues establish that PAN had pre-suit knowledge of the Asserted Patents. Resp. in Opp’n at 34–35, ECF No. 515. First, Centripetal relies on a series of interactions between the parties in 2016 and 2017. *Id.* at 34. These include, for example, emails exchanged between the parties during this time containing potential partnership discussions and the exchange of a non-disclosure agreement. *See* ECF No. 462-23. The emails also include discussions between PAN employees in which they conclude that Centripetal is a competitor. *Id.* at 981–82. PAN was also sent “teaser” marketing materials during this period that highlighted Centripetal’s technologies and their patent protection. ECF No. 462-20 at 2 (logging Centripetal’s outreach to potential partners); ECF No. 462-21 (Centripetal teaser materials); ECF No. 462-22 (same). This evidence predates the issuance of the Asserted Patents and generally would be insufficient, standing alone, to support an inference that PAN was aware of the Asserted Patents. *See State Indus., Inc.*, 751 F.2d at 1236 (“To willfully infringe *a patent*, the patent must exist and one must have knowledge of it.”); *see also Va. Innovation Scis., Inc. v. Samsung Elecs. Co., Ltd.*, 983 F. Supp. 2d 700, 709–12 (E.D. Va. 2013) (holding that knowledge of related, previously issued patents alone is insufficient to establish knowledge of later issued patents). However, such evidence is relevant to PAN’s state of mind, such as its general awareness of Centripetal’s technologies and patents and its view of Centripetal as a competitor. *See Shiley, Inc. v. Bentley Labs., Inc.*, 794 F.2d 1561, 1568 (Fed. Cir. 1986) (explaining that a finding of willful infringement is based on the “totality of the circumstances presented in the case”).

In addition to these specific interactions between the parties, Centripetal references certain public events and publications which it asserts also speak to PAN’s knowledge. These include a

patent infringement lawsuit filed by Centripetal against a PAN competitor that settled in 2018, Centripetal press releases referencing its patents, and other publications. Resp. in Opp’n at 35, ECF No. 515. Centripetal does not cite direct evidence that PAN knew of each of these events and publications or that the communications specifically mentioned the Asserted Patents. Instead, it argues that because of this “publicly available information,” it is “not credible that PAN was not aware of the related patents asserted in that case.” *Id.* These assertions, without some connection to PAN and the Asserted Patents, are too speculative to permit an inference of knowledge. *See Biedermann Techs. GmbH & Co. KG v. K2M, Inc.* (“*Biedermann*”), 528 F. Supp. 3d 407, 427 (E.D. Va. 2021) (finding assertions that a defendant “must have known” about the relevant patents were insufficient to survive summary judgment); *see also Robocast, Inc. v. YouTube, LLC*, No. 22-304-RGA, 2022 WL 16922035, at *2–3 (D. Del. Nov. 14 2022) (“[M]edia publicity surrounding an invention does not support an allegation of pre-suit knowledge absent allegations ‘bridging’ knowledge of the publicity with knowledge of the patent.”).

Finally, Centripetal points to evidence that it marked its products with the Asserted Patents upon their issuance, interacted with PAN at trade shows and other industry events, that Centripetal included a list of its patents on its website, and that PAN visited Centripetal’s website dozens of times after the issuance of the Asserted Patents. Resp. in Opp’n at 33–34, ECF NO. 516; *see* ECF No. 461-35 (Centripetal’s marked products); Videotaped Dep. of Jonathan Rogers at 122:6–123:14, ECF No. 518-9 (testifying that Centripetal and PAN representatives interacted at trade shows and industry events); ECF No. 516-30 (website listing of the Asserted Patents); ECF Nos. 519-7, 519-8, 519-9, 519-10, 519-11, 519-12 (reports indicating PAN visited Centripetal’s website). PAN challenges the sufficiency of this evidence, arguing that Centripetal cannot demonstrate that PAN ever saw Centripetal’s products at the industry events, that those products

were marked with the Asserted Patents prior to the initiation of this lawsuit, or that PAN visited the specific webpage listing the Asserted Patents. Reply at 24, ECF No. 565. These arguments are best left for trial and highlight that disputed facts and conflicting reasonable inferences exist as to this issue. The parties also presented a substantial amount of evidence, although in a summary fashion, which makes it difficult for the Court to resolve this issue without weighing facts and making inferences. Notwithstanding the limitations of Centripetal's evidence, having made all inferences in Centripetal's favor, the Court concludes that a reasonable jury, with the benefit of context that trial testimony may provide, could conclude that PAN had knowledge of the Asserted Patents prior to the filing of the present lawsuit.

PAN argues that Centripetal presents “no actual evidence of pre-suit knowledge” and that the “evidence of purportedly ‘inferable’ knowledge” offered by Centripetal is legally and factually insufficient to survive summary judgment. *Id.* at 23–24. This argument misconstrues the summary judgment standard, specifically as it relates to the issue of willfulness. As referenced above, to establish willfulness, Centripetal must show that PAN had “specific intent to infringe at the time of the challenged conduct.” *Bayer Healthcare LLC*, 989 F.3d at 987. But direct evidence is not required; “specific intent may be inferred from circumstantial evidence where a defendant has both knowledge of the patent and specific intent to cause the acts constituting infringement.” *Ricoh Co. v. Quanta Comput. Inc.*, 550 F.3d 1325, 1342 (Fed. Cir. 2008) (discussing specific intent in the context of inducement); see *Water Techs. Corp. v. Calco, Ltd.*, 850 F.2d 660, 668 (Fed. Cir. 1988) (“While proof of intent is necessary, direct evidence is not required; rather, circumstantial evidence may suffice.”).

For these reasons, the Court finds that Centripetal's evidence is sufficient to create a genuine dispute of material fact regarding willfulness. Accordingly, PAN's motion for summary judgment on the issue of willfulness is DENIED.⁹

E. Infringement Based on Foreign Sales

PAN asserts that its use, manufacturing, and sale of Accused Products outside the United States is non-infringing, and therefore sales associated with these activities should not be included in its royalty base. Mem. in Supp. at 39–40, ECF No. 462. However, the Court finds that Centripetal's evidence of domestic manufacturing of the Accused Products is sufficient to create a genuine dispute of material fact.

A patentee may recover against “whoever without authority makes, uses, offers to sell, or sells any patented invention, *within the United States*.” 35 U.S.C. § 271(a) (emphasis added). For foreign sales to be included in the royalty base of a damages award, a patentee must demonstrate that an infringing act occurred within the United States and that the infringing act has a substantial connection to the foreign sale. *See Carnegie Mellon Univ. v. Marvell Tech. Grp., Ltd.*, 807 F.3d 1283, 1306–08 (Fed. Cir. 2015); *Cal. Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 992 (Fed. Cir. 2022). For example, the Federal Circuit has explained that when “a physical product is being

⁹ Because the Court finds that Centripetal's evidence regarding PAN's pre-suit conduct is sufficient to create a material dispute of fact regarding willfulness, the Court does not address PAN's post-suit conduct. *See Biedermann*, 528 F. Supp. 3d. at 430 n.20 (noting that because “evidence that could support a finding that [the alleged infringer] had pre-suit notice of [the patent], it would be inappropriate to preclude the factfinder from considering all of [the alleged infringer's] actions relevant to such patent, including post-suit conduct, because the proper test for willful infringement ‘looks to the totality of the circumstances’” (quoting *WCM Indus., Inc. v. IPS Corp.*, 721 F. App'x 959, 970 (Fed. Cir. 2018))). Further, even if the jury ultimately concludes PAN's conduct was willful, the Court must still consider whether PAN's conduct was sufficiently egregious to warrant enhanced damages. *See Presidio Components, Inc. v. Am. Tech. Ceramics Corp.*, 875 F.3d 1369, 1382 (Fed. Cir. 2017) (explaining that “an award of enhanced damages does not necessarily flow from a willfulness finding” and is reserved for “egregious cases of misconduct”).

employed to measure damages for infringing use of patented methods,” a patentee may recover foreign sales “only when any one of those domestic actions for that unit (*e.g.*, sale) is proved to be present, even if others of the listed activities for that unit (*e.g.*, making, using) take place abroad.” *Carnegie Mellon Univ.*, 807 F.3d at 1306.

Centripetal argues that PAN “made, tested, offered for sale, and sold” the Accused Products from the United States and therefore foreign sales of those products may be included in the royalty base calculation. Resp. in Opp’n at 37–40, ECF No. 515. The Court considers the evidence offered by Centripetal to establish that PAN made and tested the Accused Products in the United States.¹⁰ In support of its theory, Centripetal relies on the deposition testimony of PAN’s Senior Vice President of Worldwide Operations, Vonnie French. Ms. French testified that NGFWs and Panorama are manufactured and tested in the United States and that the source code for PAN-OS,¹¹ Panorama’s operating system, was developed in the United States. Videotaped Dep. of Vonnie French (“French Depo.”) at 17:11–16, 18:16–21, 19:21–23, 20:16–24, 30:5–31:7, 41:4–7, ECF No. 518-12.

¹⁰ Centripetal also contends that “PAN sells the infringing combinations globally.” Resp. in Opp’n at 39, ECF No. 515. However, this argument is underdeveloped. First, the deposition testimony that Centripetal relies upon indicates that there are two entities that sell the Accused Products: PAN, which sells products in North America and globally, and Palo Alto Networks BV, a Dutch affiliate that also sells products globally. Videotaped Dep. of Vonnie French at 39:12–40:12, ECF No. 518-12. Further, Centripetal offers no evidence regarding where “substantial activities of the sales transactions occurred,” such as the “place of inking the legal commitment to buy” the product and the “place of delivery” of the product. *Carnegie Mellon Univ.*, 807 F.3d at 1308 (internal quotation marks and citations omitted). Accordingly, the Court finds this theory unavailing.

¹¹ PAN-OS includes Advanced Threat Protection and Domain Fronting Detection. ECF No. 518-16 at 632.

PAN argues that these facts are legally insufficient to establish infringement. First, PAN argues that two of the asserted claims are method claims where infringement can only be proven by the “use” of the patented method. Mem. in Supp. at 39, ECF No. 462 (citing *NTP, Inc. v. Rsch. in Motion, Ltd.*, 418 F.3d 1282, 1319 (Fed. Cir. 2005)). However, in circumstances in which “the damages-measuring product practices the method in its normal intended use,” the Federal Circuit has held infringement can be established when the product is made, used, or sold domestically. *Carnegie Mellon Univ.*, 807 F.3d at 1306–07. Centripetal’s experts opine that the Accused Products infringe in their normal use. Cole Opening Rpt. ¶ 550, ECF No. 518-5 (“PAN’s devices are intended to be used in a manner that infringes, and include technology where the only purpose is to infringe.”); Mitzenmacher Opening Rpt. ¶ 114, ECF No. 518-1 (same).¹² These expert opinions and Ms. French’s testimony are sufficient to create a genuine dispute of material fact regarding whether Centripetal can recover damages based on foreign sales for the method claims.

Second, for the remaining apparatus claims, PAN argues that infringement cannot be proven until the product is an “operable assembly of the whole.” Mem. in Supp. at 40, ECF No. 462 (citing *Deepsouth Packing Co. v. Laitram Corp.*, 406 U.S. 518, 528 (1972)). However, this overlooks that Centripetal alleges that several products, such as NGFWs and Panorama, infringe alone. Such products are operable as a whole upon their manufacturing. Regarding the infringing combinations, Ms. French’s testimony is sufficient to create a genuine dispute of material fact regarding whether the combinations are assembled as a whole in the United States. *See* French Depo. at 14:12–15:7, ECF No. 518-12 (indicating that PAN software is loaded onto NGFWs in the United States).

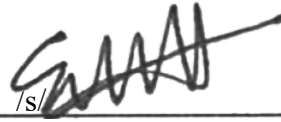
¹² While these opinions are from portions of the expert reports dedicated to indirect infringement, they are nonetheless reflective of both Dr. Cole and Dr. Mitzenmacher’s overall opinions that the Accused Products infringe in their normal use.

PAN's motion for summary judgment of non-infringement based on sales of Accused Products to customers outside of the United States is DENIED.

III. CONCLUSION

For the reasons stated above, PAN's Motion for Summary Judgment, ECF No. 460, is DENIED in part, and the Court RESERVES ruling on the issue of infringement of the '380 Patent until after the hearing scheduled for January 4, 2024.

It is SO ORDERED.

A handwritten signature in black ink, appearing to read 'E. Hanes', is written over a horizontal line.

Elizabeth W. Hanes
United States District Judge

Norfolk, Virginia
Date: January 2, 2024